CLAIMS

[Claim 1]

A resin film-forming sheet which is to be stuck to a silicon wafer to form a resin film-having wafer having a cured resin film on the silicon wafer and which satisfies the following requirements (I) to (III):

Requirement (I): the surface roughness (Ra) of the surface (α) of the resin film-forming sheet on the side thereof to be stuck to a silicon wafer is 50 nm or less;

Requirement (II): the adhesive strength (α1) of the surface (α) of the resin film-forming sheet to a silicon wafer is 1.0 to 7.0 N/25 mm; and

Requirement (III): the adhesive strength (β1) of the surface (β) of the resin film-forming sheet on the side opposite to the side thereof to be stuck to a silicon wafer, to the pressure sensitive adhesive layer of a pressure sensitive adhesive sheet having a pressure sensitive adhesive layer formed of a pressure sensitive adhesive that contains 100 parts by mass of an acrylic resin having structural units derived from butyl acrylate and acrylic acid and having a mass-average molecular weight of 600,000 to 1,000,000, and 0.01 to 10 parts by mass of a crosslinking agent, and having a thickness of 10 to 50 μm, is 4.0 N/25 mm or more.

[Claim 2]

The resin film-forming sheet according to claim 1, which has a storage elastic modulus at 23°C of 0.10 to 20 GPa.

[Claim 3]

The resin film-forming sheet according to claim 1 or 2, wherein the contact angle with water on the surface (β) of the resin film-forming sheet is 70 to 110°.

[Claim 4]

The resin film-forming sheet according to any one of claims 1 to 3, which comprises a polymer component (A) and a curable component (B).

[Claim 5]

The resin film-forming sheet according to claim 4, wherein the polymer component (A) contains an acrylic polymer (A1).

[Claim 6]

The resin film-forming sheet according to claim 5, wherein the acrylic polymer (A1) is an acrylic copolymer having a structural unit (a1) derived from an alkyl (meth)acrylate and a structural unit (a2) derived from a nitrile monomer.

[Claim 7]

The resin film-forming sheet according to any one of claims 1 to 6, which is a protective film-forming sheet for forming a protective film on a silicon wafer.

[Claim 8]

The resin film-forming sheet according to any one of claims 1 to 7, wherein the adhesive strength (β1) of the surface (β) is a higher value than the adhesive strength (α1) of the surface (α).

[Claim 9]

The resin film-forming sheet according to any one of claims 1 to 8, wherein the difference between the adhesive strength (β1) and the adhesive strength (α1) [(β1) - (α1)] is 8.0 N/25 mm or smaller.

[Claim 10]

The resin film-forming sheet according to any one of claims 1 to 9, which contains fine particles having a mean particle size of 10 nm or grater and 400 nm or smaller.

[Claim 11]

The resin film-forming sheet according to any one of claims 1 to 10, which comprises a multi-layered sheet of two or more layers formed of two or more kinds of compositions.

[Claim 12]

The resin film-forming sheet according to claim 11, wherein the multi-layered sheet comprises a layer containing fine particles, and comprises at least two layers in which at least one of kinds, mean particle sizes and contents of the fine particles are different from each other.

[Claim 13]

The resin film-forming sheet according to claim 11, wherein the multi-layered sheet comprises a first layer containing fine particles and a second layer located on the side of the surface (α) with respect to the first layer, wherein at least one of mean particle size and content of the fine particles contained in the second layer is smaller than the one of the fine particles contained in the first layer.

[Claim 14]

The resin film-forming sheet according to claim 11, wherein the multi-layered sheet comprises a layer formed of a composition containing a leveling agent and a layer formed of a composition not substantially containing

the leveling agent, wherein the layer formed of a composition containing a leveling agent is located on the side of the surface (α) with respect to the layer formed of the composition not substantially containing the leveling agent.

[Claim 15]

A resin film-forming composite sheet, which has a configuration in which the resin film-forming sheet of any one of claims 1 to 14 is laminated on a supporting sheet.

[Claim 16]

The resin film-forming composite sheet according to claim 15, which has a configuration in which the resin film-forming sheet is sandwiched between two supporting sheets.

[Claim 17]

A method for regenerating a silicon wafer by reworking a resin film-forming sheet from a laminate where the surface (α) of the resin film-forming sheet of any one of claims 1 to 14 is directly stuck to a silicon wafer, which comprises the following steps (1) and (2):

Step (1): a step of sticking the pressure sensitive adhesive layer of a pressure sensitive adhesive sheet having a substrate and a pressure sensitive adhesive layer, to the surface (β) of the resin film-forming sheet of the laminate; and

Step (2): a step of pulling the pressure sensitive adhesive sheet stuck to the surface (β) of the resin film-forming sheet in the step (1) to rework the resin film-forming sheet stuck to the silicon wafer.